

**Notice of Allowability**

Application No.

10/729,785

Examiner

Cuong V. Luu

Applicant(s)

WEI ET AL.

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/8/2006.
2. ☒ The allowed claim(s) is/are 6,7,10,11 and 14-25.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_



KAMINI SHAH  
SUPERVISORY PATENT EXAMINER

### **DETAILED ACTION**

Claims 6, 7, 10, 11, 14, 15-25 are pending. Claims 1-5, 8, 9, 12, 13, and 26-30 have been canceled. Claims 6, 7, 10, 11, 14, 15-25 have been examined. Claims 6, 7, 10, 11, 14, 15-25 are allowed.

### ***Response to Arguments***

1. Applicant's arguments, see page 8, filed 11/8/2006, with respect to the double patenting rejections of claims 1-3 and 26-27 have been fully considered and are persuasive with the cancellation of these claims. Therefore, the double patenting rejections have been withdrawn.

### **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with attorney Chung Park on 1/26/2007.

The application has been amended as follows:

2. The specification has been amended. See the Supplemental Response for Appl. 10/729785 filed on February 20, 2007.
3. Paragraph [0024] on page 6 has been amended as follows:

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The present invention generally relates to Applicants' co-pending patent applications:

"TIMING SOFT ERROR CHECK", ~~Attorney Docket No. 033994-003~~ application number

10/729596; "RELIABILITY BASED CHARACTERIZATION USING BISECTION", ~~Attorney~~

~~Docket No. 033994-004~~ application number 10/729697; and "VERIFICATION AND

CHARACTERIZATION OF NOISE MARGIN IN INTEGRATED CIRCUIT DESIGNS",

~~Attorney Docket No. 033994-006~~ application number 10/729701, filed concurrently herewith

and the entire contents of each application are incorporated herein by reference.

4. Claim 6 has been amended as following:

A method of performing a glitch check in simulating a circuit, the method comprising the following steps:

determining current maximum and minimum values for an optimization parameter of the circuit;

determining a signal characteristic value for circuit simulation based on the current maximum and minimum optimization parameters, said signal characteristic value being the width of a signal pulse;

determining a current ~~averaged~~ average optimization parameter;

calculating a prime criterion parameter based on the current minimum and maximum optimization parameters and the signal characteristic value;

determining whether the prime criterion parameter converges to a prescribed range;

if the prime criterion parameter converges into the prescribed range then parsing measurement results from the circuit simulation, saving the current average optimization parameter, and ending the process;

if the prime criterion parameter does not converge into the prescribed range;

simulating the circuit based on the current average optimization parameter;  
calculating a new signal characteristic value using the circuit simulation;  
determining the results of the circuit simulation based on the new signal characteristic value; [[and]]

setting the current average optimization parameter to a new optimization parameter in response to the new signal characteristic value[[.]]; and

repeating the process of determining whether the prime criterion parameter converges into the prescribed range,

wherein the width of the signal pulse is measured respectively for simulations based on the current minimum, current maximum and current average optimization parameters and wherein the current average optimization parameter is set to be the current minimum optimization parameter if both simulations based on the current minimum and current average optimization parameters indicate the same status, either both succeed or both fail, otherwise the current average optimization parameter is set to be the current maximum optimization parameter.

5. Claim 10 has been amended as following:

A method of performing a glitch check in simulating a circuit, the method comprising the following steps:

determining current maximum and minimum values for an optimization parameter of the circuit;

determining a signal characteristic value for circuit simulation based on the current maximum and minimum optimization parameters, said signal characteristic value being the height of a signal pulse;

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determining a current averaged average optimization parameter;

calculating a prime criterion parameter based on the current minimum and maximum optimization parameters and the signal characteristic value;

determining whether the prime criterion parameter converges to a prescribed range;

if the prime criterion parameter converges into the prescribed range then parsing measurement results from the circuit simulation, saving the current average optimization parameter, and ending the process;

if the prime criterion parameter does not converge into the prescribed range;

simulating the circuit based on the current optimization parameter;

calculating a new signal characteristic value using the circuit simulation;

determining the results of the circuit simulation based on the new signal characteristic value; [[and]]

setting the current average optimization parameter to a new optimization parameter in response to the new signal characteristic value[[.]];

repeating the process of determining whether the prime criterion parameter converges into the prescribed range;

wherein the height of the signal pulse is measured respectively for simulations based on the current minimum, current maximum and current average optimization parameters and wherein the current average optimization parameter is set to be the current minimum optimization parameter if both simulations based on current minimum and current average optimization parameters indicate the same status, either both succeed or both fail, otherwise the current average optimization parameter is set to be the current maximum optimization parameter.

6. Claim 14 has been amended as following:

A method of performing a glitch check in simulating a circuit, the method comprising the following steps:

determining current maximum and minimum values for an optimization parameter of the circuit;

determining a signal characteristic value for circuit simulation based on the current maximum and minimum optimization parameters, said signal characteristic value being a slew time of a signal transition;

determining a current averaged average optimization parameter;

calculating a prime criterion parameter based on the current minimum and maximum optimization parameters and the signal characteristic value;

determining whether the prime criterion parameter converges to a prescribed range;

if the prime criterion parameter converges into the prescribed range then parsing measurement results from the circuit simulation, saving the current average optimization parameter, and ending the process;

if the prime criterion parameter does not converge into the prescribed range;

simulating the circuit based on the current average optimization parameter;

calculating a new signal characteristic value using the circuit simulation;

determining the results of the circuit simulation based on the new signal characteristic value; [[and]]

setting the current average optimization parameter to a new optimization parameter in response to the new signal characteristic value[[,]]; and

repeating the process of determining whether the prime criterion parameter converges into the prescribed range;

wherein for a meta-stability check the slew time of the signal transition is measured respectively for simulations based on the current minimum, current maximum and current average optimization parameters and wherein the current average optimization parameter is set to be the current minimum optimization parameter if both simulations based on current minimum and current average optimization parameters indicate the same status, either both succeed or both fail, otherwise the current average optimization parameter is set to be the current maximum optimization parameter.

7. Claim 16 has been amended as following:

A method for performing a glitch check on multiple nodes of a simulated circuit, the method comprising the following steps:

determining a current average optimization parameter from a maximum optimization parameter and a minimum optimization parameter of the circuit simulation;

calculating a prime criterion parameter based on the maximum and minimum optimization parameters;

determining whether the prime criterion parameter converges to a prescribed range;

if the prime criterion parameter converges into the prescribed range, then saving the current average optimization parameter as a setup and hold time for circuit simulation calculations[[:]] and ending the process;

if the prime criterion parameter does not converge into the prescribed range;

simulating the circuit based on the current average optimization parameter;

calculating a current prime criterion parameter based on the circuit simulation;

measuring a secondary criterion parameter for all reference nodes;

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setting the status of the current simulation to fail if the simulation result does not meet a user-prescribed limit or there is any value of the secondary criterion parameters of all reference nodes greater than the user-prescribed limit; [[and]]

setting the status of the current simulation to succeed if the simulation result meets the user-prescribed limit and the values of the secondary criterion parameters of all the reference nodes are not greater than the user-prescribed limit[[.]]; and

repeating the process of determining whether the prime criterion parameter converges into the prescribed range;

8. Claim 21 has been amended as following:

The method of claim 16 wherein the current average optimization parameter is set to be the current minimum optimization parameter value when the current optimization parameter and the minimum optimization parameter indicate the same status.

9. Claim 22 has been amended as following:

The method of claim 16 wherein the current average optimization parameter is set to be the current maximum optimization parameter value when the current average optimization parameter and the minimum optimization parameter do not indicate the same status.

***Allowable Subject Matter***

**Claim 6, 7, 10, 11, 14, 15-25 are allowed. The following is an examiner's statement of reasons for allowance:**



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10. As per claims 6, 10, and 14 they are allowed because the prior art does not teach the current optimization parameter is set to be the current minimum optimization parameter if both simulations based on the current minimum and current optimization parameters indicate the same status, either both succeed or both fail, otherwise the current optimization parameter is set to be the current maximum optimization parameter as recited by the claimed invention.
11. As per claim 16, the prior art teaches a method for performing a glitch check on multiple nodes of a simulated circuit, the method comprising the following steps:
- determining a current average optimization parameter from a maximum optimization parameter and a minimum optimization parameter of the circuit simulation;
  - calculating a prime criterion parameter based on the maximum and minimum optimization parameters;
  - determining whether the prime criterion parameter converges to a prescribed range;
  - if the prime criterion parameter converges into the prescribed range, then saving the current average optimization parameter as a setup and hold time for circuit simulation calculations and ending the process;
  - if the prime criterion parameter does not converge into the prescribed range;
  - simulating the circuit based on the current average optimization parameter;
  - calculating a current prime criterion parameter based on the circuit simulation;
  - repeating the process of determining whether the prime criterion parameter converges into the prescribed range;
- but does not teach:
- measuring a secondary criterion parameter for all reference nodes;

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setting the status of the current simulation to fail if the simulation result does not meet a user-prescribed limit or there is any value of the secondary criterion parameters of all reference nodes greater than the user-prescribed limit;

setting the status of the current simulation to succeed if the simulation result meets the user-prescribed limit and the values of the secondary criterion parameters of all the reference nodes are not greater than the user-prescribed limit;

As recited by the claimed invention.

**Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."**


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cuong V. Luu whose telephone number is 571-272-8572. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah, can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. An inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CVL

  
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